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Harness Dickey & Pierce PLC
P O Box 828
Bloomfield Hills, MI 48303

EXAMINER	
MIGGINS, MICHAEL C	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/704,881	WATKINS, RICHARD L.
	Examiner	Art Unit
	Michael C. Miggins	1772

MLR

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19 and 26-28* is/are rejected.

7)☒ Claim(s) *20-25 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Examiner's Comments

1. The 35 USC 103(a) rejections set forth in the non-final action of 2/19/04, pages 2-11, paragraphs 3-8 have been withdrawn. The allowable subject matter set forth in the non-final rejections of 2/19/04, page 11, paragraph 9 remains unchanged but is repeated below for convenience.

The same rejections have been set forth for claims 1-19and 26-28 although for different reasons. The rejection is now based on the fact that applicant's disclosure defines a thermal transition temperature as melting point or glass transition temperature, see instant specification page 6, lines 12-18. Ramesh discloses that the second layer can be polyamide 6 (PA-6), PA-9, PA-10, PA-11, PA-12 and PA-66. Polyamide 6 (PA-6), PA-9, PA-10, PA-11, PA-12 and PA-66 have glass transition temperatures of 70, 51, 43, 46, 37 and 50 degrees C respectively. Ramesh teaches an annealing temperature of about 100 degrees C (column 15, lines 10-27), see rejections below.

Because different reasons for the rejection have been set forth the instant action is non-final.

Response to Arguments

2. Applicant's arguments with respect to claims 1-29 have been considered but are deemed unpersuasive.

Applicant has argued that the annealing step of Ramesh et al. reduces interlayer bond adhesion. However, Ramesh discloses improved inter-ply adhesion (column 28, lines 40-45). Applicant's citation of column 2, lines 62-67 is acknowledged but Ramesh is referring to annealing multiplayer film laminates of materials other than those taught by Ramesh et al..

Applicant's arguments that Ramesh et al. do not teach an annealing temperature of 200 degrees C has merit. However, Ramesh does teach annealing at about 100 degrees C (column 15, lines 10-27) which is the same temperature disclosed in applicant's specification (see instant specification page 21, lines 15-17).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-2 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh et al. (U.S. Patent No. 6,274,228 B1).

With regard to instant claim 1, Ramesh et al. teach a method for improving adhesion between two adjacent layers of a laminate membrane (column 3, lines 43-59), comprising the steps of forming a laminate having a first thermoplastic layer adhered to an adjacent second thermoplastic layer (column 3, lines 26-59) and having an interfacial boundary between the first thermoplastic layer and the second thermoplastic layer

(since the first layer is co-extruded with and adjacent the second layer, column 3, lines 26-59), after a lag time when the laminate is below a temperature at which significant diffusion across the interfacial boundary takes place (column 15, lines 39-45, since the annealing can take place offline thus ensuring a lag time were no diffusion takes place), annealing the laminate (column 14, lines 23-67 and column 15, lines 39-45) (applies to instant claim 1).

Applicant's disclosure defines a thermal transition temperature as melting point or glass transition temperature, see instant specification page 6, lines 12-18. Ramesh discloses that the second layer can be polyamide 6 (PA-6), PA-9, PA-10, PA-11, PA-12 and PA-66. Polyamide 6 (PA-6), PA-9, PA-10, PA-11, PA-12 and PA-66 have glass transition temperatures of 70, 51, 43, 46, 37 and 50 degrees C respectively. Ramesh teaches an annealing temperature of about 100 degrees C (column 15, lines 10-27).

With regard to instant claims 2 and 5-8, Ramesh et al. teach wherein the annealing step is at least about 50 degrees C above the thermal transition temperature the at least one polymeric component (column 15, lines 10-27 and column 17, lines 7-45, since the annealing temperature is as high as about 100 degrees C and the polyamide used as the second layer can have a glass transition temperature of 70, 51, 43, 46, 37 or 50 degrees C), wherein the laminate is annealed for at least about 15 minutes, 30 minutes, or 40 minutes (column 14, lines 47-53, since the time of exposure can be several hours) and wherein the laminate membrane is annealed at a temperature above a thermal transition temperature of at least one component of each of the first and second layers (column 15, lines 10-27, column 17, lines 7-45, since the

annealing temperature can be as high as about 100 degrees C and polyamides having a glass transition temperature of 70, 51, 43, 46, 37 or 50 degrees C can be used as the second layer and can be mixed in the first layer, column 16, lines 20-41) (applies to instant claims 5-8).

With regard to instant claim 1, Ramesh et al. teach applicant's invention substantially as claimed. However, Ramesh et al. fail to specifically teach annealing the laminate at a temperature above a thermal transition temperature of at least one polymeric component for a time sufficient for the at least one polymeric component to partially diffuse into the adjacent layer. However, the limitation is necessarily present in the invention of Ramesh et al. because Ramesh et al. teach annealing at a temperature as high as one hundred degrees (column 15, lines 10-27), which is the same as applicant's annealing temperature of up to about 100 degrees C (see instant specification page 21, lines 15-17), for a time of up to several hours (column 14, lines 47-53), which is inclusive of applicant's disclosed annealing times of 5-40 minutes (see instant specification page 7, lines 14-20). Ramesh et al. also teach polyamides with a glass transition temperature of 70, 51, 43, 46, 37 or 50 degrees C (column 17, lines 7-45). Thus the limitation is necessarily present in the invention of Ramesh et al. because Ramesh teaches the annealing times and annealing temperatures as claimed as well as polyamides which have glass transition temperatures well below the annealing temperature of 100 degrees C (applies to instant claim 1).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided the step of annealing the laminate

at a temperature above a thermal transition temperature of at least one polymeric component for a time sufficient for the at least one polymeric component to partially diffuse into the adjacent layer in the method of Ramesh et al. in order to provide improved inter-layer adhesion (applies to instant claim 1).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh et al. (U.S. Patent No. 6,274,228 B1) in view of Wang et al. (U.S. Patent No. 6,124,007).

Ramesh et al. disclose applicant's invention substantially as claimed. However, Ramesh et al. fail to disclose wherein at least one of the first and second layers includes a semi-crystalline component.

Wang et al. teach a two layer laminate which is annealed (column 3, lines 34-38) wherein at least one of the first and second layers includes a semi-crystalline component (see column 4, lines 15-20, since liquid crystals are semi-crystalline) (applies to instant claim 3) for the purpose of providing improved flexibility and burst strength (column 2, lines 35-43).

Therefore it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided at least one of the first and second layers including a semi-crystalline component in the method of Ramesh et al. in order to provide improved flexibility and burst strength as taught or suggested by Wang et al..

6. Claims 4, 16-19 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh et al. (U.S. Patent No. 6,274,228 B1) in view of Bonk et al. (U.S. Patent No. 6,082,025).

Ramesh et al. teach a method wherein the annealing step is carried out at a temperature of at least about 100, or 150 degrees C (column 14, lines 23-46) (applies to instant claims 16-17).

With regard to instant claim 28, Ramesh et al. teach wherein the thermoplastic polymeric barrier layer comprises a material selected from the group consisting of ethylene-vinyl alcohol copolymers, vinylidene chloride polymer, acrylonitrile polymer , copolymers of acrylonitrile and methyl acrylate, semicrystalline polyesters, polyethylene terephthalate, polyamides, crystalline polymers, epoxy resins based on N,N-dimethylethylenediamine and resorcinol, polyurethane engineering thermoplastics, and combinations thereof (column 4, lines 43-51) (applies to instant claim 28).

With regard to instant claims 4, 18-19 and 27, Ramesh et al. disclose applicant's invention substantially as claimed. However, Ramesh et al. fail to disclose wherein the first layer is a thermoplastic elastomer layer and the second layer is a thermoplastic polymeric barrier layer, wherein the first layer comprises a thermoplastic polyurethane prepared from a polyester diol and the second layer comprises an ethylene-vinyl alcohol copolymer, further comprising at least a third layer comprising a thermoplastic polyurethane prepared from a polyester diol that is adjacent to the second layer, wherein the thermoplastic elastomer layer comprises a material selected from the group consisting of polyurethanes prepared using polyester, polyether, and polycarbonate

diols, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, polymeric ester-ether elastomers, flexible ionomers, thermoplastic vulcanizates, vulcanized EPDM in polypropylene, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof.

With regard to instant claims 4, 18-19 and 27, Bonk et al. teach a first layer which is a thermoplastic elastomer layer and the second layer which is a thermoplastic polymeric barrier layer (column 7, lines 1-67 and column 12, lines 52-67), wherein the first layer comprises a thermoplastic polyurethane prepared from a polyester diol (column 7, lines 46-62 and column 12, lines 52-67) and the second layer comprises an ethylene-vinyl alcohol copolymer (column 12, lines 1-23 and column 12, lines 52-67), further comprising at least a third layer comprising a thermoplastic polyurethane prepared from a polyester diol that is adjacent to the second layer (column 7, lines 46-62 and column 14, lines 54-67), wherein the thermoplastic elastomer layer comprises a material selected from the group consisting of polyurethanes prepared using polyester, polyether, and polycarbonate diols, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, polymeric ester-ether elastomers, flexible ionomers, thermoplastic vulcanizates, vulcanized EPDM in polypropylene, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof (column 7, lines 31-62) (applies to instant claims 4, 18-19 and 27) in a method for forming multi-layer laminates (column 13, lines 51-64) for the purpose of providing enhanced inter-layer bonding.

Therefore it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided a first layer which is a thermoplastic elastomer layer and a second layer which is a thermoplastic polymeric barrier layer, wherein the first layer comprises a thermoplastic polyurethane prepared from a polyester diol and the second layer comprises an ethylene-vinyl alcohol copolymer, further comprising at least a third layer comprising a thermoplastic polyurethane prepared from a polyester diol that is adjacent to the second layer, wherein the thermoplastic elastomer layer comprises a material selected from the group consisting of polyurethanes prepared using polyester, polyether, and polycarbonate diols, flexible polyolefins, styrenic thermoplastic elastomers, polyamide elastomers, polyamide-ether elastomers, polymeric ester-ether elastomers, flexible ionomers, thermoplastic vulcanizates, vulcanized EPDM in polypropylene, flexible poly(vinyl chloride) homopolymers and copolymers, flexible acrylic polymers, and combinations thereof in the method of Ramesh et al. in order to provide enhanced inter-layer bonding as taught or suggested by Bonk et al.

With regard to instant claim 26, Bonk et al. do not specifically teach at least one of the polymeric components of at least one of the first and second layers has a glass transition temperature in the range of from about –30 to about 20 degrees C. However, the limitation is necessarily present in Bonk et al. because applicant states that polyester polyols have glass transition temperatures in the range of from about –30 to about 20 degrees C and incorporates by reference the polyester polyols of Bonk et al. (see instant specification page 10, line 21 through page 11, line 10). Furthermore it

would have been obvious to one of ordinary skill in the art to have provided at least one of the polymeric components of at least one of the first and second layers has a glass transition temperature in the range of from about –30 to about 20 degrees C in order to provide improved inter-layer adhesion (applies to instant claim 26).

7. Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh et al. (U.S. Patent No. 6,274,228 B1) and Bonk et al. (U.S. Patent No. 6,082,025), as applied to claims 4, 16-19 and 26-28 above, and further in view of Wang et al. (U.S. Patent No. 6,124,007).

With regard to instant claim 10, Ramesh et al. disclose applicant's invention substantially as claimed. However, Ramesh et al. fail to disclose wherein the laminate is formed into a shape by blow molding before the annealing step.

Wang et al. teach a method wherein the laminate is formed into a shape by blow molding before the annealing step (column 3, lines 33-38) (applies to instant claim 10) for the purpose of providing improved flexibility and burst strength (column 2, lines 35-43).

Therefore it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided the step wherein the laminate is formed into a shape by blow molding before the annealing step in the method of Ramesh et al. in order to provide improved flexibility and burst strength as taught or suggested by Wang et al..

With regard to instant claims 11-15, neither reference specifically teach wherein the annealing step is carried out within about 2 hours, 1.5 hours, or 1 hour, or 30 minutes, or 15 minutes of the blow molding step. However, Ramesh et al. teach that the film can be annealed or heated to elevated temperature while it is inflated (column 15, line 55-65). Furthermore, Wang et al. teach blow molding followed by an annealing step (column 8, lines 50-67). Thus, it appears that the references suggest that annealing take place while inflated or immediately after blow molding and it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided wherein the annealing step is carried out within about 2 hours, or 1.5 hours, or 1 hour, or 30 minutes, or 15 minutes of the blow molding step in order to shorten processing time thus lowering production costs (applies to instant claims 11-15).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramesh et al. (U.S. Patent No. 6,274,228 B1) in view of The Concise Encyclopedia of Polymer Science and Engineering, page 1234.

Ramesh et al. disclose applicant's invention substantially as claimed. However, Ramesh et al. fail to specifically disclose wherein the annealing temperature is at least about 80 degrees C above the thermal transition temperature of the at least one polymeric component.

The limitation is necessarily present in the invention of Ramesh et al. because Ramesh et al. teach that the first layer is ethylene/vinyl alcohol copolymer (column 3,

lines 26-33) and that the ethylene/vinyl alcohol copolymer is hydrolyzed to at least about 99% (column 16, lines 10-19). The Concise Encyclopedia of Polymer Science and Engineering, page 1234 teaches that a 99% hydrolyzed ethylene/vinyl alcohol will have a glass transition temperature of 85 degrees C. Thus, an annealing temperature of 200 degrees C is more than applicant's recited annealing temperature which is at least about 80 degrees C above the thermal transition of the at least one polymeric component since the glass transition temperature of 99% hydrolyzed EVOH is 85 degrees C and applicant's disclosure defines a thermal transition temperature as melting point or glass transition temperature, see instant specification page 6, lines 12-18.

Furthemore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided the step of annealing at a temperature which is at least about 80 degrees C above the thermal transition temperature of the at least one polymeric component in the method of Ramesh et al. in order to provide improved inter-layer adhesion.

Allowable Subject Matter

9. Claims 20-25 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regard to claim 20, from which claims 21-25 and 29 depend, the prior art fails to teach or suggest a method from which a laminate is formed wherein the first

layer comprises a thermoplastic polyurethane prepared from a polyester diol and the second layer comprises an ethylene-vinyl alcohol copolymer, and further wherein said blow molding step provides a bladder that is sealed and inflated after the annealing step. The combination of Ramesh et al. and Wang et al. disclose a post blowing annealing step but do not disclose wherein said blow molding step provides a bladder that is sealed and inflated after the annealing step.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Miggins whose telephone number is (571) 272-1494. The examiner can normally be reached on Monday-Friday; 1:30-10:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pyon Harold can be reached on (571) 272-1498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael C. Miggins

Examiner
Art Unit 1772

MCM
November 1, 2004